

WHAT IS CLAIM IS:

1. A micro grating structure, comprising:
  - a substrate;
  - a first supporting structure and a second supporting structure;
  - a first structure post and a second structure post, wherein said first structure post and said second structure post are mounted on said substrate between said first supporting structure and said second supporting structure; and
  - a grating mounted between said first structure post and said second structure post and comprising a first, a second, a third and a fourth torsion beams, wherein said first and said second torsion beams are connected to said first and said second supporting structures respectively, said third and said fourth torsion beams are connected to said first and said second structure posts respectively, and said first, said second, said third and said fourth torsion beams are twisted by an electrostatic force so as to enable said grating to be inclined at an angle with respect to said substrate.
2. A micro grating structure according to claim 1 wherein said substrate is a semiconductor substrate.
3. A micro grating structure according to claim 2 wherein said substrate is a silicon substrate.
4. A micro grating structure according to claim 1 wherein said first and said second supporting structures, said first and said second structure posts, said grating and said first, said second, said third and said fourth torsion beams are made of a low-stress silicon nitride.
5. A micro grating structure according to claim 4 wherein said first and said

second supporting structures, said grating and said first, said second, said third and said fourth torsion beams further comprise an electric conductive and light reflective layer thereon.

6. A micro grating structure according to claim 5 wherein said electric conductive and light reflective layer is made of gold.
7. A micro grating structure according to claim 5 further comprising an adhesion layer between said low-stress silicon nitride and said electric conductive and light reflective layer.
8. A micro grating structure according to claim 7 wherein said adhesion layer is made of a material selected from a group consisting of chromium, titanium and tungsten- titanium alloy.
9. A micro grating structure according to claim 7 wherein said electrostatic force is generated between said electric conductive and light reflective layer and said silicon substrate by an external power source supplied thereto.
10. A micro grating structure according to claim 9 wherein a light is diffracted on said electric conductive and light reflective layer of said grating when said grating is inclined.
11. A micro grating structure according to claim 10 wherein said light is reflected on said electric conductive and light reflective layer of said grating after said grating is returned to normal, which is resulting from a recuperative force of said first, said second , said third and said fourth torsion beams generated after said electrostatic force vanishes.
12. A micro grating structure according to claim 1 wherein a space is located among said first and said second supporting structures, said grating and said

substrate.

13. A micro grating structure according to claim 1 wherein said first torsion beam has an identical deformation to that of said second torsion beam when said first and said second torsion beams are twisted.
14. A micro grating structure according to claim 1 wherein said third torsion beam has an identical deformation to that of said fourth torsion beam when said third and said fourth torsion beams are twisted.
15. A micro grating structure according to claim 1 wherein said angle is ranged between 0 and 1 degree.
16. A micro grating structure, comprising:
  - a substrate;
  - a first supporting structure and a second supporting structure;
  - a plurality of pairs of structure posts, each pair of said structure posts comprise a first structure post and a second structure post, wherein said first structure post and said second structure post are mounted on said substrate between said first supporting structure and said second supporting structure; and
  - a plurality of gratings mounted between said first structure post and said second structure post of each pair of said structure posts respectively and having an interval between each two adjacent ones, wherein each said grating further comprises a first, a second, a third and a fourth torsion beams, said first and said second torsion beams are connected to said first and said second supporting structure respectively, said third and said fourth torsion beams are connected to said first and said second structure posts respectively, and said first, said second, said third and said fourth torsion beams are twisted by an electrostatic force so

as to enable said grating to be inclined at an angle with respect to said substrate.

17. A micro grating structure according to claim 16 wherein said substrate is a semiconductor substrate.

18. A micro grating structure according to claim 17 wherein said substrate is a silicon substrate.

19. A micro grating structure according to claim 16 wherein said interval is less than 2  $\mu\text{m}$ .

20. A micro grating structure according to claim 16 wherein said first and said second supporting structures, said plurality of pairs of structure posts, said plurality of gratings and said first, said second, said third and said fourth torsion beams are made of a low-stress silicon nitride.

21. A micro grating structure according to claim 20 wherein said first and said second supporting structures, said plurality of gratings and said first, said second, said third and said fourth torsion beams further comprise an electric conductive and light reflective layer thereon.

22. A micro grating structure according to claim 21 wherein said electric conductive and light reflective layer is made of gold.

23. A micro grating structure according to claim 21 further comprising an adhesion layer between said low-stress silicon nitride and said electric conductive and light reflective layer.

24. A micro grating structure according to claim 23 wherein said adhesion layer is made of a material selected from a group consisting of chromium, titanium and tungsten-titanium alloy.

25. A micro grating structure according to claim 23 wherein said electrostatic

force is generated between said electric conductive and light reflective layer and said silicon substrate by an external power source supplied thereto.

26. A micro grating structure according to claim 25 wherein a light is diffracted on said electric conductive and light reflective layers of said plurality of gratings when said plurality of gratings are inclined.

27. A micro grating structure according to claim 26 wherein said light is reflected on said electric conductive and light reflective layer of each grating after said plurality of gratings are returned to normal, which is resulted from a recuperative force of said first, said second, said third and said fourth torsion beams generated after said electrostatic force vanishes.

28. A micro grating structure according to claim 16 wherein a space is located among said first and said second supporting structures, said plurality of gratings and said substrate.

29. A micro grating structure according to claim 16 wherein said first torsion beam has an identical deformation to that of said second torsion beam when said first and said second torsion beams of said plurality of gratings are twisted.

30. A micro grating structure according to claim 16 wherein said third torsion beam has an identical deformation to that of said fourth torsion beam when said third and said fourth torsion beams of said plurality of gratings are twisted.

31. A micro grating structure according to claim 16 wherein said angle is ranged between 0 and 1 degree.